

# opción

Revista de Antropología, Ciencias de la Comunicación y de la Información, Filosofía,  
Linguística y Semiótica, Problemas del Desarrollo, la Ciencia y la Tecnología

Año 35, 2019, Especial N°

# 21

Revista de Ciencias Humanas y Sociales  
ISSN 1012-1537/ ISSNe: 2477-9385  
Depósito Legal pp 198402ZU45



Universidad del Zulia  
Facultad Experimental de Ciencias  
Departamento de Ciencias Humanas  
Maracaibo - Venezuela

# Multidimensional analysis of factors affecting students' employment

**Olga Shavandina<sup>1</sup>**

<sup>1</sup>Altai state university  
[shavandina.olga@yandex.ru](mailto:shavandina.olga@yandex.ru)

**Anton Vasilev<sup>2</sup>**

<sup>2</sup>Altai state university  
[Vasilev.Anton@yandex.ru](mailto:Vasilev.Anton@yandex.ru)

**Tatjana Philippova<sup>3</sup>**

<sup>3</sup>Altai state university  
[Philippova.Tatjana@\\_yandex.ru](mailto:Philippova.Tatjana@_yandex.ru)

**Irina Kiryushina<sup>4</sup>**

<sup>4</sup>Altai state university  
[Kiryushina.Irina@\\_yandex.ru](mailto:Kiryushina.Irina@_yandex.ru)

## Abstract

This article concerns the problems that students face when they increase their workload at a higher educational institution by engaging in labor activities via comparative qualitative research methods. As a result, self-fulfillment is a complex and lengthy process that resides in the awareness of one's own potential and in its embodiment in the chosen kind of occupation in the future. The authors conclude that in tough competition conditions in the labor market, the number of employed students, to a greater degree, characterizes the relevance of graduates of the reported profile (specialty) and from a certain university.

**Keywords:** Students, labor, market, employment rate.

# Análisis multidimensional de los factores que afectan el empleo de los estudiantes

## Resumen

Este artículo trata sobre los problemas que enfrentan los estudiantes cuando aumentan su carga de trabajo en una institución de educación superior al participar en actividades laborales a través de métodos de investigación cualitativa comparativa. Como resultado, la realización personal es un proceso complejo y prolongado que reside en la conciencia del propio potencial y en su personificación en el tipo de ocupación elegida en el futuro. Los autores concluyen que en condiciones difíciles de competencia en el mercado laboral, el número de estudiantes empleados, en mayor medida, caracteriza la relevancia de los graduados del perfil informado (especialidad) y de una determinada universidad.

**Palabras clave:** Alumnos, mano de obra, mercado, tasa de empleo.

## 1. INTRODUCTION

Recently, the system of higher education in Russia has undergone great changes in the training of future specialists. Factors such as the reduction in the number of state-funded places, the cosmopolitan diffusion of for-profit education, the emergence of exclusively commercial specialist training programs, high tuition fees, small scholarships, the need to pay rent, and low parental incomes have led students to combine study and work in both part-time and full-time frameworks. According to the Federal State Statistics Service, less than half of the students in Russian universities are studying federal budget resources over the last years. Given that reality, most students have to pay expensive tuition fees. In addition, the real

incomes of parents have sharply declined; all of this is pushing students to work and study at a higher educational institution at the same time.

The modern labor market provides students with such an opportunity, since possible activities such as remote work, part-time work, and flextime work, among others, have been developed, etc. An important factor is also the desire to gain work experience in their specialization, to understand whether their choice of profession has been made correctly, and to gain time by studying and working at the same time. It should be noted that working while studying gives students the opportunity to show themselves in a certain activity and to realize themselves since the learning process does not always provide them with it.

Another factor that affects the share of students who work and study at a higher educational institution at the same time is the ability to earn extra money for the more complete satisfaction of their wants. The modern rhythm and lifestyle of young people have changed, paid leisure services have expanded, many items of prestigious consumption have appeared, and many hobbies (traveling, sports, recreational activities, etc.) require funds. The legislative framework that governs relations in the field of education and labor makes it possible for intramural students to work. However, the consequences of studying and working at the same time lead to obvious contradictions both in the legal and institutional aspects of higher education and in the content of the education received / not received.

Therefore, the conflict between the higher education system and the labor market seems inevitable.

## **2. LITERATURE REVIEW**

The main trends of the modern higher education system in Russia are aimed at the preparation of specialists (regardless of the level of education) who possess broad knowledge and a wide range of competencies and have lifelong learning skills. In this regard, according to Efimova and Makoveychuk (2015), the motivation of applicants increases when choosing a place of study, which necessitates analyzing the rating positions and image indicators of higher educational institutions. As noted in the articles of N.D. Guskova and I.N. Krakovskaya, the assessment of the competitiveness of any university shows the ability of this educational institution to meet society's needs to prepare highly qualified personnel who meet modern requirements. The increase in the university's competitiveness level naturally and positively affects the quality and volume of human capital, which, ultimately, is the main goal of any university. Bulatova (2017), Porter (2016), Hull (2015) and others raise the problems of the competitiveness and employment of university graduates and their interaction with employers in their work. Analyzing the promotion of the educational services of Russian universities to foreign markets, Professor G.A. Krasnova, Ph.D., notes, Over the past 10 years the export of the Russian higher education has grown by almost 3 times in number from 100.9 thousand people up to 282.9 thousand people; and

by 4 times in volume of the funds raised - from \$ 356.2 million to \$ 1,462.6 million. The key barriers that prevent the export expansion of the Russian education are: unfriendly visa, migration, labor legislation for foreign students; a small number of English-language educational programs; living conditions and medical care; low level of teaching Russian as a foreign language; unskilled level of international services of higher educational institutions and lack of experience; lack of coordination of export management at all levels of education management; problems with the recognition of educational documents.

The classics of marketing and management, such as Porter (2016), and others devoted their works to the methods of analysis and promotion in the market of goods and services, including the educational one. The problems of educational policies of foreign countries and the employment of graduates of educational institutions are the subject of constant monitoring of the European Union statistical organizations and are the subject of discussion in scientific works of researchers such as M. Kahanek, K.F. Zimmerman, and others. The analysis of the works mentioned confirms the argument that the empirical assessment of the effects of the competition policy of higher educational institutions is necessary for the form of a subsequent comprehensive analysis of the factors affecting the employment of graduates.

### **3. MATERIALS AND METHODS**

In connection with the growth of student employment, the problem of combining studying at a higher educational institution

along with labor activities is growing more urgent and requires a comprehensive assessment. Analysis of factors affecting the students engaged in labor activities should be carried out by educational institutions, the structure of which currently has departments for employment and employment promotion of students and graduates.

#### **4. SURVEY METHODS**

The use of empirical methods made it possible to perform optimization modeling, the purpose of which is to assess the factors that affect the students to study and work at the same time. The adjustment of the research methodology of the specified attributes/factors was carried out based on the methods of correlation and regression analysis. When calculating the employment rate for a particular form of education, we use the factors presented in Table 1 as attributes/factors affecting the share of students who work and study at the higher educational institution at the same time. Considering that the intramural education and 5 factors/attributes of this table are analyzed at the initial stage, the optimization model will have the following form (2):

$$Z_1 = \sum_{j=1}^5 k_{1j} \cdot x_{1j} ;$$

$$0 < x_{1j} \leq b; \tag{2}$$

$$Z_1 \rightarrow \max ,$$

where  $i = 1$  – for intramural education;

$j = \overline{1;5}$  – the number of main factors influencing, in the opinion of the authors, the students to study and work at the same time.

## **5. RESULTS**

One of the most important stages in the activities of any organization, including an educational institution, is the marketplace segmentation that involves dividing the market into distinct consumer groups, that is, market segments. As part of the labor market study, whose participants are students of law and economics departments of intramural education and those who study and work at the same time, the plan is to perform multidimensional factor segmentation using data from an optimization model and questionnaire. Segmentation is stipulated for the following reasons:

- It provides a better understanding of the needs of consumer-students who study at the higher educational institution and work at the same time;

- It provides a better understanding of the nature of the competitive struggle, based on which it is easier to choose market segments for their development and to determine what characteristics the services shall have to gain competitive advantages in our case;

– The need to use limited resources in the most profitable areas;

– The need to develop a set of activities aimed at promoting students and graduates to the labor market (Hull, 2015).

The authors propose to begin multidimensional factor segmentation with the definition of the market base, the measurement of which is presented in Figure 1.

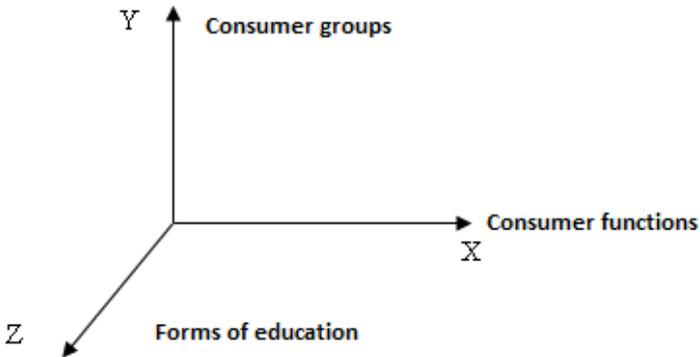


Fig. 1: Measurement of the market base

Generally, consumer functions will be understood as factors affecting the share of students and undergraduates who study at a higher educational institution and work at the same time. Attributes/factors of the first level, presented in Table 2, were used to build an optimization model and are the basis of macro segmentation. To perform segmentation by consumer groups, you can use various criteria: geographical, socio-economic, demographic, psychological, behavioral, etc. In this study, the grouping of consumers is carried out according to training areas (profiles) or specialties.

Thus, a large number of indicators can be distinguished on the Y-axis in general (Dvořáková & Zborková, 2014):

- Y1 –Jurisprudence – students who study Jurisprudence;
- Y2 –Economics – students of the Faculty of Economics being trained in the field of Economics;
- Y3 –Economic security – students of the Faculty of Economics being trained in the field of Economic security;
- Etc.

The number of consumer groups is finite and determines the multidimensional segmentation.

In this work, the form of education is the criterion for segmentation along the Z-axis:

- Intramural education (Z1) – intramural students;
- Intra-extramural education (Z2) – intra-extramural students;
- Extramural education (Z3) – extramural students;
- Distant education (Z4) – distant education students (Zatonsky & Siroтина, 2014).

This macro segmentation grid will have a general view and can be detailed according to various indicators, for example, factors of the 2nd level (X-axis) and profiles within the areas of training (the state law, civil law, criminal law profiles corresponding to the training area of jurisprudence) (Y-axis). In this paper, the study is conducted according to the results of the questionnaire, the perimeter of which is determined by a number of intramural students in the training areas of law and economics. In this case, the macro segmentation grid can be presented as follows (Guskova & Krakovskaya, 2010):

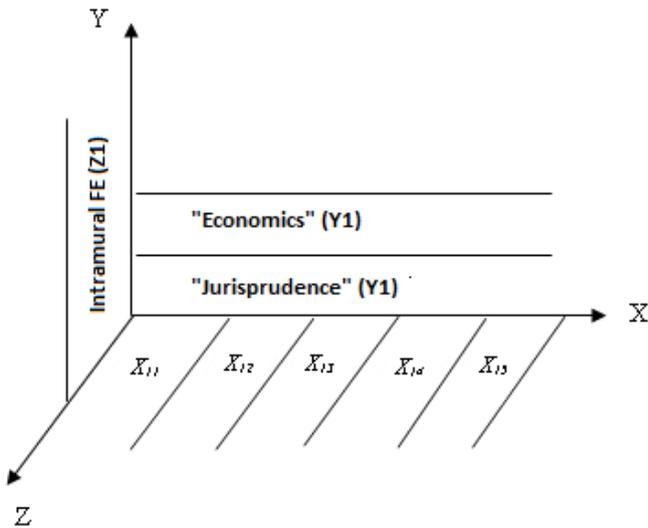


Fig. 2: Special case grid of the multidimensional factor segmentation

Let us consider the features of the attained segments. The results of the survey of intramural students are presented in Table 1 and reflect the

dependence between the training area of students and undergraduates and the most important motives for their employment.

Table 1: Consumer attitude to factors that affect employment (%)

<b>Indicator name</b>	<b>Tuition fee (<math>X_{11}</math>)</b>	<b>Financial independence (<math>X_{12}</math>)</b>	<b>Gaining work experience (<math>X_{13}</math>)</b>	<b>Self-fulfillment (<math>X_{14}</math>)</b>	<b>Meeting one's own needs (<math>X_{15}</math>)</b>
<b>Training area of «Jurisprudence» (<math>Y_1</math>)</b>	23,5	22,7	21,9	12,1	19,8
<b>Training area of «Economics» (<math>Y_2</math>)</b>	22,9	22,9	20,1	13,2	20,9

More than 23% of students who study jurisprudence consider tuition fee as a basic need for employment. In addition, future lawyers who study at a higher educational institution and work at the same time are quite strongly motivated for financial independence and gaining work experience, including the one by profession. The level of basic needs slightly exceeds the degree of motivation for these factors, by 0.8% and 1.6%, respectively (Feresin &, 2017). Slightly less than 23% of students who study economics at a higher educational institution and work at the same time single out two factors as basic needs considering them to be equivalent: tuition fees and financial independence. About 21% of students in this group are motivated to meet their own needs when deciding on employment considering this

factor to be more significant compared to the gaining work experience, including the one by profession attribute (Rodionova, 2011).

Students who study at a higher educational institution and work at the same time and those who have entered the survey perimeter think of self-fulfillment least of all. According to the authors, this is because self-fulfillment is a complex and lengthy process that resides in the awareness of one's own potential and in its embodiment in the chosen kind of occupation in the future. Realization of the inherent abilities, according to the concept of Maslow's (1970) hierarchy of needs, represents the highest need of the individual and the individual must satisfy the initial needs of the lowest order for this indicated need to arise. Thus, the analysis of factors that affect the employment of students, using the above proposed optimization model and the segmentation of the set of students who got into the perimeter of the survey, can identify the most significant factors/attributes, set their rating for each form of education, as well as for each area or specialty (Andrush, 2012; Marbán & Mulenga, 2019).

## **6. CONCLUSION**

In our opinion, to determine the relationship between the measured values or factors/attributes, optimization modeling should be supplemented with an assessment of the consistency of the students' opinions who study at a higher educational institution and work at the same time and pairwise rank correlation. The coefficients of multiple correlations (concordance), reflecting the dependence between the

quantitative and qualitative signs of homogeneous objects, characterize how strongly the opinions of intramural students constitute or vary by the factors being assessed in our case. Rank correlation coefficients will determine the nature and strength of the relationship of each pair of factors considered (Kahanec & Zimmerman, 2012). A significant correlation between two attributes or factors is always evidence of the existence of some statistical connection in a given sample. To determine the consistency of students' opinions on factors affecting employment, we use Kendall's concordance coefficient which can be calculated using the formula (4):

$$W = \frac{12 \cdot S}{m^2 \cdot k \cdot (k^2 - 1)}, \tag{4}$$

Where  $m$  is a number of experts in the group,

$k$  is a number of factors ( $k=5$ ),

$S$  is a sum of squared differences of ranks (deviations from the mean).

The values of Kendall's concordance coefficients are presented in Table 4 and calculated using the capabilities of Microsoft Office Excel.

Table 2: Consistency coefficients of students' opinions in training areas

Sec. No.	Training area of students included in the perimeter of the survey	Coefficient value
1	«Jurisprudence»	0,70
2	«Economics»	0,67
3	Across the multitude of students surveyed	0,68

The obtained values of multiple correlation coefficients are in the range of 0.6 to 0.8 ( $0.6 < W < 0.8$ ) which indicates a fairly strong consistency of experts (students). It can be assumed with great probability that there is indeed a community of opinions in this group of students. In addition, if there are coalitions within the group of the students surveyed, then the generalized opinions of coalitions are not opposed to each other. To determine the rank correlation coefficients ( $r_s$ ) we use the Spearman coefficients, which are described by formula (5) (Choi et al., 2009):

$$r_s = 1 - \frac{6 \cdot \sum_j d_j^2}{n \cdot (n^2 - 1)} \quad , \quad (5)$$

Where  $d_j$  is a difference of the corresponding ranks of random variables (attributes/factors);  $j = \overline{1, n}$

$n$  is a sample size.

In general, the Spearman correlation coefficient has certain properties:

1. The values of the correlation coefficient satisfy the double inequality

$-1 \leq r_s \leq 1$  , provided that if  $r_s = 1$  , then there is a strictly direct connection, if  $r_s = -1$  - it is a strictly inverse connection, and if  $r_s = 0$  - the connection between random variables is practically absent;

2. A finer gradation of the link force between random variables (in our case between factors or attributes) is described by the Chertok scale (table 3).

Table 3: Chertok scale

Sec. No.	Correlation coefficient value	Nature of the linking force
1	$ r_s  < 0,1$	There is almost no link
2	$0,1 \leq  r_s  < 0,3$	Weak link
3	$0,3 \leq  r_s  < 0,5$	Moderate link
4	$0,5 \leq  r_s  < 0,7$	Average linking force
5	$0,7 \leq  r_s  < 0,9$	Strong link
6	$0,9 \leq  r_s  < 1$	Very strong link

Using this mathematical apparatus, we analyze the pairwise influence of all factors/attributes ( $X_{Ij}$ ) and calculate the Spearman's rank correlation coefficients. To calculate the rank correlation coefficients, the authors used data from the first level factors presented in Table 2.

## REFERENCES

- ANDRUSH A. 2012. **The Reverse Synergy: Another Way of Thinking**. International Journal of Economic Practices and Theories. Vol. 2. N° 2. Romania.
- BULATOVA, G. 2017. **Monitoring and Evaluation of Employment of University Graduates**. Economics Profession Business. Vol. 4, No 4: 18-23. Barnaul. Russia.
- CHOI, J., LEE, J., & SOHN, S. 2009. **Impact analysis for national R&D funding in science and technology using quantification method II**. Research Policy. N° 38. Pp. 1534–1544. DOI: 10.1016/j.respol.2009.09.005. Netherlands.
- DVOŘÁKOVÁ, L., & ZBORKOVÁ, J. 2014. **Integration of Sustainable Development at Enterprise Level**. Procedia Engineering. Vol. 69, pp. 686–695. Doi: 10.1016/j.proeng.2014.03.043. Netherlands.
- EFIMOVA, I., & MAKOVEYCHUK A. 2015. **Analysis of the educational services market and new trends**. RUDN Bulletin, Sociology series. October 2015. Vol. 15, N° 4: p. 149-158. Russia.
- GUSKOVA, N., & KRAKOVSKAYA, I. 2010. **Investments in the human capital of the university: the organizational aspect**. Problems of the theory and practice of management. N° 5. USA.
- HULL, J. 2015. **Risk Management and Financial Institutions**. Wiley. p. 742. USA.
- KAHANEC, M., & ZIMMERMAN, K. 2012. **EU Labor Markets after Post-Enlargement Migration**. Berlin-Heidelberg: Springer. p. 345. Germany.

- MASLOW, A. 1970. **Motivation and Personality [Motivatsiya i Lichnost'] Corporate Management (2nd ed.)** – N.Y.: Harper & Row. St.Pet. Evrasia. p. 316. Russia.
- PORTER, M. 2016. **Competitive strategy: A methodology for analyzing industries and competitors.** Trans. from English - M.: Alpina Publisher. p. 453. Russia.
- RODIONOVA, A. 2011. **Labor employment of students in the context of learning.** On the example of St. Petersburg. Theory and practice of social development. N° 7. USA.
- ZATONSKY, A., & SIROTINA, N. 2014. **Prediction of economic systems using a model based on a regression differential equation.** Economics and Mathematical Methods. Vol. 50. N° 1: 91–99. USA.
- Marbán, J. M., & Mulenga, E. M. (2019). **Pre-service Primary Teachers' Teaching Styles and Attitudes towards the Use of Technology in Mathematics Classrooms.** International Electronic Journal of Mathematics Education, 14(2), 253-263. <https://doi.org/10.29333/iejme/5649>





**UNIVERSIDAD  
DEL ZULIA**

---

# **opción**

Revista de Ciencias Humanas y Sociales  
Año 35, Especial N° 21, (2019)

Esta revista fue editada en formato digital por el personal de la Oficina de Publicaciones Científicas de la Facultad Experimental de Ciencias, Universidad del Zulia.  
Maracaibo - Venezuela

[www.luz.edu.ve](http://www.luz.edu.ve)

[www.serbi.luz.edu.ve](http://www.serbi.luz.edu.ve)

[produccioncientifica.luz.edu.ve](http://produccioncientifica.luz.edu.ve)